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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/700,121	11/03/2003	John Edward Lecky	107044-0039	5059

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EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 12/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/700,121	Applicant(s) LECKY, JOHN EDWARD	
	Examiner Jonathan S. Crepeau	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 11-14 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16 is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-10 and 15 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>11/16/06 2/10/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1-10, 15, and 16 in the reply filed on November 16, 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Objections

2. Claims 8-10 are objected to because of the following informalities: Each of these claims appears to have an erroneous dependency. It appears that claim 8 should depend from claim 7, claim 9 should depend from claim 8, and claim 10 should depend from claim 7. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 4, 6, 7, 10, and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Bai et al (U.S. Patent 6,620,538). In column 5, line 35, the reference teaches a method comprising the steps of measuring changes in fuel cell current and voltage before and after a shunting operation, and then calculating the resistance of the fuel cell. The shunting operation reduces the load to substantially zero. Regarding claim 4, between the shuntings, the current and voltage of the fuel cell is applied to a load, i.e., a fixed resistance (see col. 12, line 60). Regarding claim 7, the resistance is evaluated as a measure of fuel cell hydration (see col. 18, line 18).

Thus, the instant claims are anticipated.

5. Claims 1, 2, and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by WO 03/092093. The reference is generally directed to a fuel cell electrode. On page 19, line 33, the reference teaches a method of measuring the serial resistance of a fuel cell comprising the steps of operating the fuel cell at a constant current of 40 mA, cutting off the current, analyzing the voltage, and determining the resistance. Based on this disclosure, the steps recited in instant claims 1 and 2 would inherently be carried out, i.e., measuring the fuel cell voltage before current cut-off, and changing the load across the fuel cell.

Thus, the instant claims are anticipated.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bai et al.

The reference is applied to claims 1, 4, 6, 7, 10, and 15 as stated above. However, the reference does not expressly teach that the fuel cell is a direct methanol fuel cell as recited in claims 8 and 9.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use a direct methanol fuel cell in the apparatus of Bai et al. These fuel cells are known to have high safety, energy density, and portability, among other characteristics. Further, at column 18, line 38, Bai et al. teach that "the described procedures can be equally applied to any type of fuel cell." As such, the use of a direct methanol fuel cell in the apparatus of Bai et al. would be rendered obvious to the skilled artisan.

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 03/092093 in view of Bai et al.

WO '093 is applied to claim 1, 2, and 7 for the reasons stated above. However, the reference does not expressly teach that changes in calculated resistance over time are evaluated as a measure of fuel cell hydration, as recited in claim 3.

As noted above, Bai et al. teach this feature in column 18, line 18.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to evaluate the resistance of the fuel cell of WO '093 as a measure of hydration. In column 18, line 30, Bai et al. teach that fuel cell hydration and output current can be "optimized" as a result of this analysis. Accordingly, the artisan would be motivated to evaluate the resistance of the fuel cell of WO '093 as a measure of hydration.

Allowable Subject Matter

9. Claim 16 is allowed.
10. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter:

Claim 5 recites, among other steps, the steps of adjusting input parameters of a DC-DC converter to establish an initial duty cycle, reading the stack voltage and current, and changing the duty cycle. Claim 16 recites the step of signaling an associated microprocessor under pulse-width modulation control to adjust the duty cycle of DC-DC switches. Mathias et al (U.S. Patent

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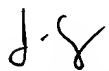
6,376,111) is considered to the closest prior art to this subject matter. This reference teaches the use of a DC-DC converter in calculating fuel cell resistance, but does not teach or fairly suggest establishing and adjusting a duty cycle as claimed.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau
Primary Examiner
Art Unit 1745
December 5, 2006